



STUDENT-CENTERED VIRTUAL LEARNING ENVIRONMENT PROPOSAL

Juan Silva¹ | Andrea Astudillo² | Elio Fernandez²

¹ Departament of Education and Director Center CIIET Universidad de Santiago de Chile.

² Professional Design Instructional online Center CIIET Universidad de Santiago de Chile.

ABSTRACT

Using Information and Communication Technology (ICT), especially in Learning Management Systems (LMS) enable extending teaching beyond the physical boundaries of the classroom. Using LMS could enable designing innovative virtual learning environments (VLE), placing the student in the center of the educational process. For this to happen, VLEs should consider different aspects, primarily a change in methodology from the traditional content and teacher based method to one that is based on e-activities and centered on the student. This article presents a student-centered VLE basing its design on e-activities. It presents the main aspects of the model and its implementation in LMS.

KEYWORDS: e-activities, virtual learning environment, e-learning, methodologies, student-centered learning.

1. INTRODUCTION

The Learning Management Systems, (LMS), enable designing virtual learning environments (VLEs). Student-centered methods should be used to make these formative spaces truly innovative, to modify traditional and behaviorist transferal of knowledge. This requires including role changes in teachers and students, bringing in ICT - especially Web 2.0 tools- as spaces to share and disseminate knowledge throughout the web, while contributing to the collective construction of new knowledge. Especially at the university level LMS can be built-in as teaching support in one of the following modalities: Face-to-face class support the platform is an extension of the classroom; b-learning combines face-to-face and virtual elements; e-learning, where 100% of the educational process is virtual (García Aretio et al., 2007; Barberà and Badia, 2004, Pandya, 2015).

Although virtual classrooms are one of the most widespread ICT innovations in university teaching, experience and literature show that the traditional educational model is normally transferred to the virtual space, appealing to behaviorist methodologies. It is transferred from face-to-face to virtual classrooms, recreating the same spaces and functions (Adell, 2004b). It is important to make progress in student-centered virtual learning environments to generate quality virtual learning, to provide meaningful learning for the students (Silva, 2011, Silva, 2013). Thus, teachers need to acquire the necessary competencies to integrate ICT in their general teaching practice, specifically in the virtual area. They are required to design and moderate VLEs, migrating from teacher-centered methodologies (in the form of lectures, and passive), toward student-centered methodologies and e-activities (active, dynamic and participative methodologies) (Miranda et al., 2010). This article describes a design proposal of a student-centered virtual learning environment, focused on e-activities instead of contents. It is a space for social construction of knowledge that demands an active role of the participants, who are responsible for their learning processes, in which the teacher is a "tutor" who provides guidance and direction.

2. THE NEW LEARNERS

We are in the presence of a new generation of young people who strongly identify and are familiar with the use of technology. It is a

generation that has been born and raised in the digital era. Its main features are: Students outperform their teachers in mastering these technologies and have easier access to data information and knowledge on the web; they live in an interactive culture, and they base their communicational paradigm on interactivity using instant and customizable media such as the internet (Oblinger and Oblinger, 2005). This generation of students coexists with technology as part of its usual environment. University teachers face students of this digital era where information and learning are neither bounded by the classroom walls nor provided exclusively by the teacher.

A study on the use of the internet in Calalan universities concluded that students with intensive and creative access to web tools, especially Web 2.0 tools such as wikis, blogs, social networks, etc., usually have more trouble adapting to traditional university teaching and even have lower performance levels (Duart et al., 2008). The latter is not related to the lack of abilities, but that they would expect to learn in more creative environments using the ICT they normally use in their lives. Thus, innovative use of ICT is required, for students to take on the leading role of their learning, enabling them to have a say, interact and contribute knowledge to the network (Pedró 2006). Literature shows that the generation is not homogenous; there are different profiles depending on the access to technological devices, hours of exposure to them and types of use (Kennedy, 2009). García et al. (2012) emphasize "formal" and "informal" uses, setting apart technologies and uses applied to living and learning. They conclude that young people use ICT to live, but not to learn or handle practical work for their learning process. The students have a certain level of competence in digital technology, the way they use the technologies varies according to their purpose (Gallardo et al., 2015).

3. VIRTUAL LEARNING ENVIRONMENTS (VLE)

A virtual learning environment (VLE) is a computer application designed to facilitate pedagogical communication between the participants of an educational process that is distance, face-to-face or mixed, combining both modalities in different proportions (Adell et al, 2004a; Gros, 2004). A VLE can be used to: Distribute educational material in digital format (text, images, audio, simulation, games, etc.), conduct online discussions, add important content to

the network or enable participation of experts or external professionals in debates or talks.

A VLE combines tools for: Synchronic and asynchronic communication; learning material management; participant management; system follow-up and students' progress assessment; teacher and student technological to optimize different teaching/learning process phases: planning, implementing, developing and evaluating the curriculum (García Areito et al., 2007). In short, a VLE seeks to make the most of the space provided by computing and telecommunications, to the best interest of education. The design of a learning environment should consider a set of features provided by the environment for its development. Dillenbourg (2000) highlights seven basic elements to consider in the design of virtual learning environments:

- VLE is a space designed for educational purposes.
- A VLE is a social space.
- The social space is explicit.
- Students are active and at the same time, are actors who co-construct the virtual space.
- Distance learning is not the only VLE.
- VLEs integrate different technologies and multiple teaching approaches.
- Most of the VLEs do not exclude physical environments.

Garrison and Anderson (2005) have reached the conclusion that online education, such as that created in a VLE, should highlight the importance of context and the creation of learning communities to facilitate reflection and critical discourse. These authors consider the community crucial to maintaining critical personal research and the construction of meaning. In a community given to inquiry, regarding interaction, these authors highlight three elements participating in the virtual learning process that are essential to achieving meaningful learning: social, cognitive and teaching elements.

Despite the benefits of VLEs, it is important to note that adopting one does not guarantee innovation or improvement in the quality of education. Thus, designing and implementing a VLE to innovate effectively in online teaching processes requires planning teacher training considering competencies in ICT and use of technology in these spaces; methodologies for collaborative networking; in the role of the teacher as designer and host of online education experiences.

4. STUDENT BASED METHODOLOGIES

Inserting ICT in education for them to truly produce innovation in teaching and contribute to producing more and better learning requires a change in methodology. The success of incorporating ICT in education goes hand-in-hand with methodological changes. In this sense, Salinas (2004) states that during the first years of use of ICT, projects were based on technical innovation to create technology-based learning environments. Now, the focus is on students themselves, and on the methodology. New thinking demands solid methodological education, and at the same time, a student-based focus.

The methodologies used for decades in education, such as case studies, collaborative work, and project-based learning, among others, maintain their character, however ICT enhance them. With the advent of ICT, new methodologies are not created, but the existing ones are enhanced. This is made possible by the opportunities ICT have to offer, to search and access information, interaction, collaboration and to expand the class beyond the borders of the classroom. For Mason (1998), new methodologies are not invented; rather, the use of ICT sheds new light on better teaching, supported on online environments whose strategies are everyday prac-

tices of face-to-face learning, but are now simply adapted and re-discovered in their virtual format.

There is a set of techniques associated to ICT linked to student-based methodologies, where students build their own knowledge in a didactic action and within the framework of a teacher-led learning strategy (Salinas et al., 2008). These methodologies lead us to base learning on activities instead of the contents, which implies deep changes in student and teacher performance, and on how to plan the curriculum, and how to design and plan subjects and classes. Gros (2011) establishes the differences between conceiving the teaching process as based on contents and activities.

Contents-based learning		Activity-based learning
Students are usually reactive and passive, waiting for what the teacher does or decides.	>	Students learn actively, without expecting the teacher to decide for them.
The decision margin for students is small.	>	A lot of freedom for students and space for their decisions regarding certain important elements in their learning.
Individual learning is fostered.	>	It fosters collaborative learning with their classmates.
Students do not have much space for individual learning.	>	Students have the chance to be autonomous in their learning.
Memory and content replication skills.	>	Skills related to processes, based on results and on seeking, selecting and managing information.
Personal and professional education is frequently limited to certain periods of life.	>	Life-long personal and professional learning.

Figure 1: Content-based learning vs. activity-based learning Gros, B (2011, p.39).

Activity-based learning places students in the center of the learning process, giving them the leading roles and favoring collaborative and autonomous learning. It enables students to develop higher order skills demanded by the knowledge society and that are useful not only for academic life but also for professional development. Active methodologies base the educational process on students to generate situated learning, where the teacher is a mediator focusing on learning instead of teaching, fostering participation, collaboration, cooperation, creativity, reflection, analysis, and critique, through teaching methodologies such as: Learning based on problems, team learning, case studies, project-based learning, flipped classrooms, social learning, among others, that are articulated with learning results and assessment. The latter is not based only on exams, but on products that account for the learning achieved.

VLEs enable designing learning spaces under non-traditional methodology focuses, transitioning from individual learning to collaborative learning, from knowledge transmission to its construction, from a teacher based activity to student based activity. The role of teachers is going to change significantly, meaning that training will focus more on situation design and learning contexts, mediation and tutoring, and on communication strategies (Salinas, 2003).

5. E-ACTIVITIES

The Activities in VLE, for some authors e-activities, are a set of actions the participants are required to develop to achieve the set

out objectives. Activities are the nucleus of this learning modality. They give meaning to the actions to be carried out by participants, such as reading a document, watching a video, participating in a forum, etc. E-activities carry the teaching script developed by the teacher or the designer of the VLE teaching process.

The concept of e-activities, coined by Salmon (2002), refers to virtual activities and presents a diagram that includes diverse elements related to activity organization, considering aspects directed toward both participants and their tutors. The main elements of design quality of teaching strategies include a correct design of the internal organization of activities. According to Salinas et al. (2008), they should consider: learning objectives (concepts, procedures, attitudes); grouping and size of proposed groups; the type of projected communication exchange, expected interventions (argumentation, Q and A, negotiation of meanings, etc.) and activity dynamics; process: phases, activities included, participants' roles, delivery, timing, necessary material (core and support), the role of the teacher and form of evaluation; time the course takes place (directly related to the competency of the students to develop the activity).

6. A PROPOSAL FOR A STUDENT-CENTERED VLE

The proposal is based on student-centered learning methodology, established under the conviction that subjects learn by "doing" and "interacting." From this point of view, it fosters developing "activities" that prefer concrete teamwork related to concrete situations driven towards problem-solving or developing higher order skills.

Since the proposal is student-centered, e-activities are at the center of the dynamics of the students' work. Specific instructions are set out for the work required to achieve the proposed goals. The e-activities articulate with the rest of the resources, such as, presentations, documents, platform tools that are required to facilitate and enhance the students' learning (Silva, 2011; Silva and Romero, 2014).

The proposal favors user interactivity with the learning resources and participants of the learning community. From the teaching point of view, it is aimed towards learning dynamics based on "learning by doing," where the pillar is the interactivity among users, generating spaces for socializing and feedback within the virtual learning community. The use of methodology aimed towards teamwork or collaboration is encouraged, generally through course content problem solving. This favors social learning, which enhances personal learning for students, fostering developing new competencies they will use throughout their lives. The proposal (Figure 2) seeks to develop meaningful learning experiences for participants, at a personal and group level, fostering reflection, debate and the construction of personal and collaborative products. It aims towards e-learning at the service of innovation, having tridimensional learning goals, considering the conceptual, procedural and attitudinal dimensions.

Conceptual among the learning strategies, it considers explicit and implicit theoretical elements accessed in the learning activities. E-activities are at the core of the instructional design, and depending on its objective, elements with conceptual contents, such as texts, informative videos, external websites, mobile apps, papers, among others, will be taken into consideration. Procedural learning e-activities make students carry out procedures, tasks or products, forcing them to develop skills according to the objectives available in the instructional design. Thus, e-activities involve a learning modality in which students must play an active role. For this to occur, it is essential to establish a teaching technique or methodological proposal to enable: debate, dialogue, co-construction, analysis, and proposals, among others. Attitudinal considers elements of value or attitudes students are expected to develop in the process of the online course. Aspects, such as commitment, responsibility in their roles as students, are vital for the learning process, and it requires and establishes a strong

proactive and independent component.

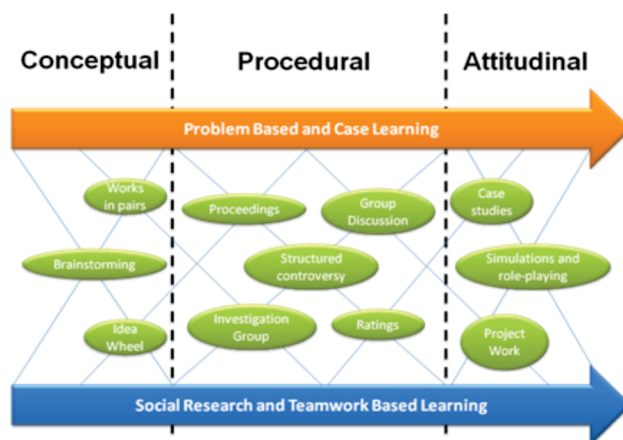


Figure 2: Tridimensional learning objectives (elaborated by the author)

The proposal aims towards the tri-dimensionality of the learning objectives, which are necessary to consolidate an effective learning process with a practical and attitudinal core. The concept of learning for this proposal is "Applied Learning," i.e., learning is only achieved if the participant applies concepts, skills, and attitudes in an active process. Without this tridimensional emphasis, the learning process is limited to an intentional discourse, without a purpose in praxis.

7. THE PROPOSAL IN THE PLATFORM

The proposal comes to life from technical structuring of a virtual platform lodged in a Learning Management System (LMS) that has been organized through an intuitive iconography that is easy to navigate for all types of users. In this way, there is access to this environment from different devices (PCs, tablets, smart-phones). The possibility of embedding our icons has enabled developing non-standard interfaces with an allusive identity to the topic or learning goal presented by the course.

Permanent elements (Figure 3) are the first area of the interface, which is a crosscutting space in the course, is available throughout the complete execution of the teaching experience. The elements of this space serve different purposes and have different features for tutors and participants.



Figure 3: Permanent elements (elaborated by the author)

Permanent elements consider forums of guidance, social and doubts, the course program, a video presenting the course, hosted by the teacher, and a synthesis of the vision shown in the learning route. Other spaces can complement these elements.

Module (Figura 4) the structure of each course is generated based on modules made up of learning activities offered by each of them in a network (Díaz and Ramírez, 2002; Silva, 2011). This space contains the unit structure, where e-activities are the core element, organizes different elements that cover different yet related aspects in the unit development, and are operational for e-activities.



Figure 4: Module structure (elaborated by the author)

E-activities consider the following aspects Title, Description, Objectives/Competencies, Time, Appropriation Activities, Evaluation and Supplementary Activities. Appropriation activities are the set of participant activities that are compulsory to achieve the proposed goals, linked to internal platform resources (forums, wikis, glossaries, assignments, etc.), and external ones (texts, videos, images, audio, etc.); Evaluation details how the activity will be assessed; Supplementary activities enable students to delve into the content in the appropriation activity content. The proposal seeks to focus the learning on the student, the techniques that best agree with these educational principles and that are enhanced by networking.

Presentation it provides a general overview of the unit, its objectives, the assigned e-activities and the expected product, if applicable, giving the participant an overview of the work to be done in the unit. Additionally, it can be complemented with a video hosted by the teacher of the module. Contents presents the contents that the student needs to know to perform adequately in the unit. It is the material of the course itself, prepared by the teacher or teaching team. Evaluation contains the access to each related activity evaluation and the product of the module, if applicable. The additive activities and product consider the assessment instruments, such as correction keys, rubrics, among others. The learning activities contain checking indicators to check if the objective set out is achieved. Library presents the resources used in the e-activities – documents, presentations, videos, etc. – that are both compulsory and supplementary. It provides direct access to the resources outside the context of the e-activity. Tools provide access to the platform sites used in the module, where students share and interact with classmates and the tutor, send products or assignments. There are individual elements such as assignments, questionnaires, etc. and other collaborative ones such as forums, wikis, workshops, databases, glossaries, etc.

7. CONCLUSION

The proposal for the design of a student-centered VLE, responds to understanding network learning that positions the student beyond a unique virtual environment as a source of knowledge. Consistent with conceptual visions related to the notion of eLearning 2.0, this model is open to social web sources outside LMS that contribute to building VLEs, assuming connective currents of learning, where external nodes of information lodged in open, participative platforms are accessed, and at the same time, endorse implicit or explicit didactics by turning to these web apps to develop learning evidence or products by the student.

The design and implementation of a student-centered VLE, driven by E-activities, offers an opportunity to renew teaching practices, is an invitation to reflect on how the teaching-learning practice is conceived and the roles played in this process by students, teachers, technologies and materials. Including VLEs does not guarantee innovation or improving the quality of teaching. The teaching models need to be modified placing the student at the center of the process, therefore, the E-activities need to be located at the center of the pedagogical design and active methodologies need to be included, making the most of the connectivity made available through ICT.

Designing and implementing a student-based VLE focused on E-activities is a major challenge. It requires time and effort and brings students closer to the communicative and multi-media interactivity they are part of outside the borders of the classroom. It enables teachers to introduce new methodological strategies, improving the learning experience. Finally, it makes a VLE a useful instrument to update education, more in tune with the demands of the knowledge society that seeks for students in training to develop skills linked to the search and organization of information to solve problems, work collaboratively, produce and share products through networking.

BIBLIOGRAPHY

1. Adell, J.Castellet J and Pascual, J. (2004a). Selección de un entorno virtual de enseñanza/aprendizaje de código fuente abierto para la Universitat Jaume, available at http://cent.uji.es/doc/eveauji_es.pdf, accessed 16 June 2010.
2. Adell, J. (2004b). Nuevas tecnologías en la formación presencial: del curso on-line a las comunidades de aprendizaje. *Curriculum: Revista de teoría, investigación y práctica educativa*, 17, p.57-92. available at http://elbonia.cent.uji.es/jordi/wp-content/uploads/docs/Quirriculum_2004.pdf, accessed 18 June 2010.

3. Barberà, E. and Badia, A. (2004). Educar con aulas virtuales: Orientaciones para la innovación en el proceso de enseñanza y aprendizaje, Machado, Madrid.
4. Diaz J. and Ramirez T. (2002). Un Modelo de Diseño Instruccional para la Elaboración de Cursos en Línea. Universidad Veracruzana Virtual, available at <http://www.uv.mx/jdiaz/DisenoInstrucc/ModeloDisenoInstruccional2.htm#>, accessed 15 November 2012.
5. Dillenbourg, P (2000). Virtual learning environments, Workshop on virtual learning, available at <http://tecfa.unige.ch/tecfa/publicat/dil-papers-2>, accessed 15 December 2010.
6. Duarte, J., Gil, M., Pujol, M and Castaño, J. (2008). La Universidad en la sociedad RED, usos de la internet en educación superior, Ariel, Barcelona.
7. Gallardo, E., Marqués, L., and Bullen, M. (2015). Students in higher education: Social and academic uses of digital technology. *Revista de Universidad y Sociedad del Conocimiento (RUSC)*, 12(1), p.25-37, available at <http://dx.doi.org/10.7238/rusc.v12i1.2078>, accessed 4 December 2015.
8. García Aretio, L. (coord.), Ruiz, M. and Domínguez, D. (2007). De la educación a distancia a la educación virtual, Ariel, Barcelona.
9. García, I. Gros, B. and Escofet, A. (2012). La influencia del género en la cultura digital del estudiantado universitario. *Athenea Digital: revista de pensamiento e investigación social*, 12(3), p.95-114. available at <http://atheneadigital.net/article/viewFile/Garcia/pdf>, accessed 12 March 2013.
10. Garrison, D.R and Anderson, T. (2005). El e-learning en el siglo xxi: Investigación y práctica, Octaedro, Barcelona.
11. Gros (2004). La construcción del conocimiento en la red: límites y posibilidades, *Revista Teoría de la Educación: Educación y Cultura en la Sociedad de la Información*, 5, available at http://www3.usal.es/~teoriaeducacion/rev_numero_05/n5_art_gros.htm, accessed 15 September 2010.
12. Gros, B. (2008). *Tramas, conexiones y artefactos*. Gedisa, Barcelona.
13. Gros, B. (2011). *Evolución y retos de la educación virtual: construyendo en el siglo XXI*. Editorial UOC, Barcelona.
14. Kennedy, G., Judd, T. S., Churchward, A., Gray, K., & Krause, K.-L. (2009). First year students experiences with technology: Are they really digital natives?, *Australasian Journal of Educational Technology*, 24(1), p.108–122
15. Oblinger, D. G., and J. L. Oblinger, (2005). *Educating the Net Generation*, EDUCAUSE. Washington, D.C.
16. Pedró, F. (2006). Aprender en el nuevo milenio: Un desafío a nuestra visión de las tecnologías y la enseñanza. OECD-CERI
17. Mason, R. (1998). Models of online courses, *ALN Magazine*, 2(2).
18. Miranda, M. J., Guerra, L., Fabbri, M. and López, E. (2010). *Experiencias universitarias de innovación docente hispano-italianas en el espacio europeo de educación superior*. Sevilla: Mergabum.
19. Pandya, V. (2015). Reseraches and innovations in practice teaching: Use of multimedia in distance education, *International Education & Research Journal* 1(1), p.5-8, available at <http://ierj.in/journal/index.php/ierj/article/view/4/17>, accessed 5 October 2015.
20. Salinas, J. (2003). El diseño de procesos de aprendizaje cooperativo en situaciones virtuales, in: *Redes de comunicación en la enseñanza: las nuevas perspectivas del trabajo corporativo*, Martínez, F. (Comp.), Paidós, Barcelona, pp.157-182.
21. Salinas, J. (2004). Innovación docente y uso de las TIC en la enseñanza universitaria. *Revista de Universidad y Sociedad del Conocimiento (RUSC)*, 1(1), available at <http://dx.doi.org/10.7238/rusc.v1i1.228>, accessed 5 April 2011.
22. Salinas, J., Pérez, A. and De Benito, B. (2008). *Metodologías centradas en el alumno para el aprendizaje en red*, Madrid, Síntesis.
23. Salmon, G. (2002). *E-activities: The Key to Online Teaching, Training and Learning*, Kogan Page, London.
24. Silva, J. (2011). *Diseño y moderación de Entornos Virtuales de Aprendizaje*, Editorial UOC, Barcelona.
25. Silva, J and Romero, M. (2014). La virtualidad una oportunidad para innovar en educación: Un modelo para el diseño de entornos virtuales de aprendizaje, *Didasc@lia Didáctica y Educación*, 5(1), p.1-2, available at <http://ojs.uo.edu.cu/index.php/Didascalia/article/view/3851>, accessed 18 July 2015.
26. Silva, J. (2013) Understanding the construction of the teaching discourse in an on-line environment *International Education Studies*, 6(3), pp.143-155, available at <http://dx.doi.org/10.5539/ies.v6n3p143>, accessed 10 March 2014.